AUTHOR: Yarema, S.Ya.

TITLE: Investigation of the characteristic equation corresponding to the solving equation of a cylindrical shell.

PERIODICAL: Referativnyy zhurnal, Matematika, no. 11, 1962, 65, abstract 11B265 (Nauchn. zap. In-ta mashinoved. i avtomatiki. AN USSR. Ser. mashinoved., 1961, v. 8, 110 - 118)

TEXT: The author studies the characteristic equation

$$k^8 - 4n^2 k^6 + \left(6n^4 + \frac{1}{c^2}\right) k^4 - 4n^2 (n^2 - 1)^2 k^2 + n^4 (n^2 - 1)^2 = 0 ,$$

$$n = 0, 1, 2, 3, \ldots,$$

which solves equations of the stress-strain state of a cylindrical shell. The roots are found by the application of the method of a small parameter according to

$$c^2 = \frac{h^2}{12 (1 - v^2) R^2} ,$$

Card 1/2

Investigation of the characteristic equation S/044/62/000/011/027/064
                                                         A060/A000

where h is the thickness, and R is the radius of the shell. According to the characteristics of the roots the paper analyzes the possiblity of simplifying the solving equation, and an estimate of the precision of these simplifications is given.

A.N. Tyumanok

[Abstracter's note: Complete translation]

Card 2/2

S/879/62/000/000/028/088
D234/D308

AUTHORS: Leonov, M. Ya., Vitvitskiy, P. M. and Yarema, S. Ya.
(L'vov)

TITLE: Theoretical and experimental investigation of elastic-plas-
tic deformations during the extension of a plate with a
slot

SOURCE: Teoriya plastin i obolochek; trudy II Vsesoyuznoy konfe-
rentsii, L'vov, 15-21 sentyabrya 1961 g. Kiev, Izd-vo
AN USSR, 1962, 196-199

TEXT: The elastic-plastic deformation is reduced to the deforma-
tion of an ideal elastic body whose displacements are discontinuous
on certain surfaces. With the aid of this model the authors solve
the problem of an infinite plate with a slot, subject to forces
perpendicular to the slot. N. I. Muskhelishvili's method is used.
The critical load is found to be $\sqrt{(1 - 2/)}$ multiplied by critical
stress. The experiments, carried out on steel plates, gave results
coinciding with the theoretical data in the initial stages except
in the incubation period. There are 2 figures.
Card 1/1

KORNILOV, G.I.; YAREMA, S.Ya.

Plane specimens with cracklike concentrators for the experimental
study of plasticity bands. Vop. mekh. real'. tver. tela no.1:
29-36 '62.   (MIRA 16:1)
(Elastic plates and shells) (Deformations (Mechanics))

10, 3600

AUTHOR: Yarema, S. Ya.

TITLE: An approximate particular solution for the case of a temperature
              problem of a cylindrical shell

√B

TEXT: From the equation which allows to solve the temperature problem in
a closed cylindrical shell, the fundamental solution is derived. By fundamental
solution is meant the solution in the case of concentrated warm-up of a free
shell of infinite length. The solution obtained, simplified at the expense of
the terms of secondary importance, is used to derive particular integrals of the
initial system of equations of the problem. Formulas are given for determining
the stresses and moments in the shell.

SUBMITTED: May 20, 1961

Card 1/1

S/020/63/148/003/010/037
B104/B186

AUTHORS: Leonov, M. Ya., Academician AS KirSSR, Vitvitskiy, P. M.,
Yarema, S. Ya.

TITLE: Gliding strips occurring due to the stretching of plates
having crack-like concentrators

PERIODICAL: Akademiya nauk SSSR. Doklady, .v. 148, no. 3, 1963, 541 – 544

TEXT: Thin plates (200·300 mm) made of soft sheet steel that has crack-like
stress concentrators in a direction perpendicular to the concentrators pro-
duced by cutters are stretched. The gliding strips could be observed by eye.
Four stages of deformation were estbalished: 1) A stage of incubation with
no plastic deformation occurring; 2) the stage, which is characteristic of
the first appearance of mat spots at the ends of the cracks; 3) the stage,
which is characteristic of the appearance of gliding strips, 20 – 40 mm long,
that start from the end of the crack and make an angle of 47 – 54° with the
axis of the concentrators; 4) the stage, which is characteristic of the
simultaneous appearance of gliding strips at many spots combining into a
gliding band. The results of an analytic investigation of the stages using

Card 1/2

Gliding strips occurring ...   S/020/63/148/003/010/037
                                                B104/B186

the method developed by N. I. Muskhelishvili (Nekotoryye osnovnyye zadachi matematicheskoy teorii uprugosti - Some basic problems of the mathematical theory of elasticity, M., 1954) show satisfactory agreement with experiment if an ideal plastic-elastic material is assumed. Deviations between the angle of the gliding bands and the load at which these occur are attributed to the finiteness of the width of these bands, and to the solidification of the deformed material in the vicinity of the crack ends. There are 4 figures.

SUBMITTED: February 5, 1962

Card 2/2

YAREMA, S.Ya.; RATYCH, L.V.

Experimental determination of the structural strength parameter
of cast iron. Vop. mekh. real. tver. tela no.3:33-37 '64.
(MIRA 17:11)

Card 2 2

YAREMA, S.Ya.

Investigating plasticity bands during the stetching of plates having an applied concentrator. Vop. mekh. real'. tver. tela no. 2:177-190 '64.   (MIRA 17:9)

RATYCH, L.V.; YAREMA, S.Ya.

Stength of brittle specimens with annular concentrators subjected
to torsion. Vop. mekh. real'. tver. tela no. 2:191-198 '64.
(MIRA 17:9)

YAREMA, S.Yu.

Solution of the temperature problem for a shallow spherical shell subjected to concentrated heating. Nauch.zap.IMA AN URSR.Ser.mashi-noved. 10:80-89 '64.   (MIRA 17:10)

L 21025-66   EWT(d)/EWT(m)/EWP(w)/EWP(v)/EWP(k)/EWA(h)/ETC(m)-6   IJP(c)   WW/EM/GS

ACCESSION NR: AT5024280   UR/0000/65/000/000/0057/0067

AUTHORS: Yarema, S. Ya. (L'vov); Gnatykiv, V. N. (L'vov)

TITLE: A study of the temperature distribution in sloped shells and plates with destructive boundary conditions on their surfaces

SOURCE: Nauchnoye soveshchaniye po teplovym napryazheniyam v elementakh konstruktsiy. 5th, Kiev. Teplovyye napryazheniya v elementakh konstruktsiy (Thermal stresses in construction elements); doklady nauchnogo soveshchaniya, no. 5, Kiev, Naukova dumka. 1965, 57-67

TOPIC TAGS: shell structure heating, shell, shell theory, temperature effect, temperature field, temperature stress

ABSTRACT: The mathematical modeling of the stationary temperature field for shells and plates is studied. The field is determined from the formula

$$t = p\,\frac{\cos p\gamma}{\sin p}\,T + \frac{p^3 \sin p\gamma}{3(\sin p - p\cos p)}\,T_1,$$

where $p^2 = h^2\,\Delta - \frac{\partial}{\partial \tau}$, 2h is the shell thickness, Δ - the Laplace operator; $\tau = \frac{t}{a^2 h^2}$ where t is time, a is the coefficient of heat conduction; $\gamma = \frac{z}{h}$

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L 21025-66

ACCESSION NR: AT5024280

is a dimensionless coordinate along the shell thickness computed from its mean surface. T and T_1 are functions characterizing the temperature distribution along the thickness of the shell and are given by

$$T = \frac{1}{2} \int_{-1}^{1} t\, d\gamma, \quad T_1 = \frac{3}{2} \int_{-1}^{1} t\gamma\, d\gamma.$$

Additional first, second, and third order boundary condition equations are given as shown in Table 1 on the Enclosure, where $L_1(p)$ are differential operators and ψ_1 are the functions given. The discussion is limited to sloping shells whose mean surface follows Euclidean metrics. The authors seek to model the stationary temperature field which gives a solution of the equations

$$L_{11}(p)T + L_{12}(p)T_1 = \Psi_1,$$
$$L_{21}(p)T + L_{22}(p)T_1 = \Psi_1,$$

and of the fundamental field equation. The field is visualized as consisting of two components: 1) the temperature field in an infinite shell defined by surface boundary conditions, and 2) the temperature field defined by boundary conditions at surface contours on the shell. Interest is focused on problems wherein the

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L 21025-66

ACCESSION NR: AT5024280 0

field is completely defined by the first component. Such is the case for closed or infinite shells, or when the slope is so gentle that contours are far removed from the region of study. A solution for T and T_1 is derived and applied to certain cases. An approximation method for solving the heat conduction equation is developed. Temperature distribution curves are shown to indicate variation with heat conduction coefficient. The given approximation method applies except in cases where Ψ_1 varies with large intensity. Orig. art. has: 2 figures, 2 tables, and 16 equations.

ASSOCIATION: none:

SUBMITTED: 14May65   ENCL: 01   SUB CODE:

NO REF SOV: 003   OTHER: 001

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L 21025-66

ACCESSION NR: AT5024280

Table 1

Boundary conditions	L_{ij}	τ_i
1st order	$L_{11} = L_{22} = p\,\mathrm{ctg}\,p;\ L_{12} = -L_{21} = \dfrac{1}{3}\dfrac{p^2}{1-p\,\mathrm{ctg}\,p}$	$\tau_1 = t_1$ $\tau_2 = t_2$
IInd order	$L_{11} = L_{22} = p^2;\ L_{12} = -L_{21} = -\dfrac{1}{3}\dfrac{p^3\,\mathrm{ctg}\,p}{1-p\,\mathrm{ctg}\,p}$	$\tau_1 = \dfrac{q_{m1}}{\lambda}$ $\tau_2 = \dfrac{q_2}{\lambda}$
IIIrd order	$L_{11} = p(\varepsilon_1\,\mathrm{ctg}\,p - p);\ L_{12} = \dfrac{p^2(p\,\mathrm{ctg}\,p + \varepsilon_1)}{3(1-p\,\mathrm{ctg}\,p)}$	$\tau_1 = \varepsilon_1 t_1$
	$L_{22} = p(\varepsilon_2\,\mathrm{ctg}\,p - p);\ L_{21} = -\dfrac{p^2(p\,\mathrm{ctg}\,p + \varepsilon_2)}{3(1-p\,\mathrm{ctg}\,p)}$	$\tau_2 = \varepsilon_2 t_2$

Card 4/4 BK

PEREDERIYENKO, Ye.I.; YAREMA, S.Ya.

Structural strength parameters. Fiz.-khim. mekh. mat. 1 no.2:
198-202 '65.   (MIRA 18L6)

1. Fiziko-mekhanicheskiy institut AN UkrSSR, L'vov.

WW/TM/DJ/GD/WH

L 06069-67   EWP(e)/EWT(m)/EWP(w)   IJP(c)   SOURCE CODE: UR/0000/65/000/000/0338/0344

35

ACC NR: AT6020805   (N)

24 B+1

AUTHORS: Yarema, S. Ya. (L'vov); Ratych, L. V. (L'vov)

ORG: none

TITLE: A study of brittle fracture of specimens with stress concentrations

SOURCE: AN UkrSSR. Institut mekhaniki. Kontsentratsiya napryazheniy (Concentration of stresses). no. 1. Kiev, Naukova dumka, 1965, 338-344

TOPIC TAGS: brittleness, stress concentration, material fracture, iron, pig iron, material strength

ABSTRACT: The authors investigate the effects of stress concentrations on the strength of specimens of brittle, microscopically nonuniform materials. The material used in the study was gray iron, chosen for its brittle properties and the fact that it exhibits structural nonuniformity caused by graphite ingredients which serve as natural stress concentrators. After normalization or lubricant quenching, the gray iron displayed a minimal amount of plastic deformation (not greater than 0.2%). Torsional tests indicated that the specimens were highly brittle. The iron was formed into plates with circular openings of varying diameters, and the plate dimensions (120 x 400 x 2 mm) were selected so that the effects of edges on the stress condition at the opening would be negligibly small. The results of the experiments are shown in Fig. 1, where the small circles are data points from the first set of measurements

Card 1/3

Fig. 1.
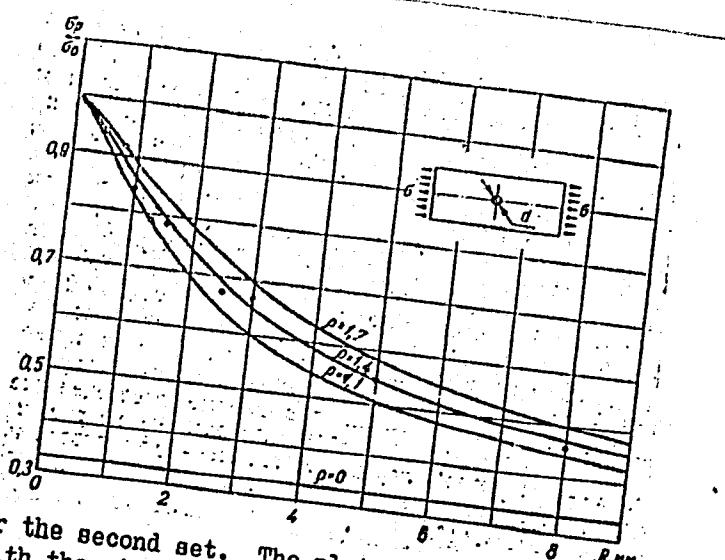
and the dot points are for the second set. The plot clearly indicates the variation of the fracture loading with the size of opening. The fracture loading was determined on the basis of the macrostress hypothesis acc...

where ...

ACC NR: AT6020005

macrostress concentration given by

$$k = \cfrac{2va^3}{\cfrac{1}{(1+v)(1+a)^3(1+2a+2a^3)} + \cfrac{3+11a+25a^2+40a^3+42a^4+24a^5+8a^6}{(1+2a+2a^3)^3}};$$

$$a = \frac{\rho}{R}.$$

Hence k varies both with the structural nonuniformity (ρ) of the material and with the size of the opening R. Additional stress concentration tests were made on strips with hyperbolic grooves. Orig. art. has: 4 equations and 4 figures.

SUB CODE: 20/ SUBM DATE: 11Oct65/ ORIG REF: 004

Card 3/3 egh

L 01119-66 EWT(d)/EWT(m)/EWP(n)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) WJ/RD/EM

AUTHOR: Yarema, S. Ya.; Ratych, L. V.

TITLE: Effect of structural microinhomogeneities of materials on the strength of strips with hyperbolic notches

TOPIC TAGS: structural microinhomogeneity, macrostress theory, breaking load, hyperbolically notched strip, structural strength parameter, tensile test, effective stress concentration coefficient, macroscopic brittle fracture theory, brittle fracture

ABSTRACT: On the basis of the macroscopic theory of brittle fracture, the authors determine the breaking loads for strips with hyperbolic notches, i.e. strips with deep symmetric bilateral grooves, stretched by a system of forces statistically equivalent to the force P applied over the axis of symmetry of the strip (Fig. 1). The experimental investigation was performed on strips of three materials: organic glass, U8 steel, and SCh 21-40 gray cast iron, i.e. materials which fracture in the presence of minimal plastic deformations. The structural strength parameter

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L 01119-66

ACCESSION NR: AP5019657

for the materials investigated was, in conditions of plane stressed state: for U8 steel, $\delta = 0.16$ mm; for organic glass, $\delta = 0.28$ mm; and for gray cast iron, $\delta = 0.36$ mm. The experimentally obtained values of the effective stress concentration coefficients were found to be in good agreement with the concentration coefficients of macrostresses, which is an experimental confirmation of the macroscopic theory of brittle fracture, or the macrostress theory. (This theory, advanced by M. Ya. Leonov (Osnovy mekhaniki uprugogo tela, vyp. 1, Izd. AN Kirg. SSR, Frunze, 1963), assumes that the effect of microstructural inhomogeneities of a real solid is determined by the properties of a certain finite volume of the solid enclosed within a sphere with a fixed (for a given material) radius δ, termed the structural strength parameter. The properties of such spheres, outlined at any point in a solid, are assumed to be identical. The magnitude of the radius δ depends on the structural inhomogeneities of the material, their magnitude, type, and distribution density. The sphere of radius δ may be construed as the minimum volume of a given material which, on the basis of the law of statistics, displays mechanical properties determinable by conventional tensile tests. The strength parameter δ serves as the basis for determining macrodeformations.) Thus, this theory may be recommended as a method for the analytic determination of effective stress concentration coefficients. The practical application of the inferences

Card 2/4

L 01119-66

ACCESSION NR: AP5019657   3

of the macrostress theory requires determining the δ for each given material,
which can be accomplished with the aid of only a few experiments. Here, however,
it should be borne in mind that the parameter δ also takes into account --even if
only indirectly -- the microplastic deformations that accompany the brittle frac-
ture of real solids. Therefore, it must be assumed that δ will also to some
extent depend on the type of stressed state. Orig. art. has: 3 figures, 30 formu-
las.

ASSOCIATION: Fiziko-mekhanicheskiy institut AN UkrSSR, L'vov (Physico-Mechanical
Institute, AN UkrSSR)

SUBMITTED: 13Mar65   ENCL: 01   SUB CODE: MM, MT

NO REF SOV: 007   OTHER: 005

Card 3/4

L 01119-66

ENCLOSURE: 01

Fig. 1

Card 4/4
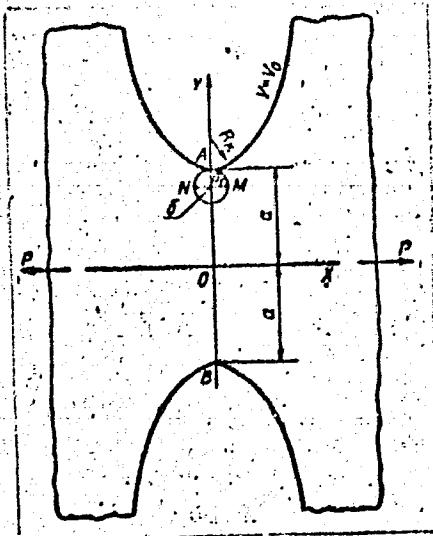
L 33054-66   EWT(m)/EWP(w)/T/EWP(t)ETI   JD

ACC NR: AP6024171   SOURCE CODE: UR/0369/66/002/001/0010/0014

AUTHOR: Yarema, S. Ya. (Editorial colleague); Krestin, G. S.

ORG: Physicomechanics Institute, AN UkrSSR, L'vov (Fiziko-mekhanicheskiy institut AN UkrSSR)

TITLE: Determination of the modulus of cohesion of brittle materials by compression of notched discs

SOURCE: Fiziko-khimicheskaya mekhanika materialov, v. 2, no. 1, 1966, 10-14

TOPIC TAGS: test method, compressive strength, brittleness, tensile test, shear stress, stress analysis, cyclic load, flat plate model

ABSTRACT: A solution to the problem of the limit equilibrium of a disc with a notch placed symmetrically relative to the center, compressed by two forces directed along the axis of the notch. The solution is used as the basis of a method for determination of the modulus of cohesion K of brittle materials for which experimentation by tensile testing of ordinary flat notched specimens is often very difficult. In the solution, the method of successive approximations is used to solve the problem of the stress state of the disc at the ends of the notch. To solve the problem of determining the modulus of cohesion, samples in the form of notched cylinders are compression tested, and the breaking load is substituted in the following formula: $\pi \lim_{r \to 0} \sqrt{r}\, \sigma_y (r, P_{sp}) = K$, $(P_{kp} = P_{or})$ to determine K. The authors have used this method with samples of concrete. Ye. I. Perederiyenko took part in the preparation and conducting of the experiments. Orig. art. has: 2 figures and 11 formulas. [JPRS]

SUB CODE: 20 / SUBM DATE: 24Apr65 / ORIG REF: 004

Card 1/1

YAREMA, V., inzh.; KAPLUN, N., inzh.

      Experience with large-panel construction in Karaganda.
      Stroitel' 8 no.2:3-4 F '62.   (MIRA 16:2)
                 (Karaganda--Apartment houses)
                 (Precast concrete construction)

YAREMA, V.D., inzh.; PODCHASOV, A.N., inzh.

Automatic equipment complexes on surfaces of mines under construction.
Shakht. stroi. 8 no.10:24-25 O '64.   (MIRA 17:12)

1. Kombinat po stroitel'stvu shakhtnykh sooruzheniy Karagandinskogo
ugol'nogo basseyna.

KICHIGIN, ..., dotsent; VASILEVSKIY, V.V., inzh.; IGNATOV, S.N., inzh.;
YAREMA, V.D., kand. tekhn. nauk

Investigating the breaking of sandstone as applicable to
actuating mechanisms on cutter-loaders reinforced with
impregnated diamond fragments. Izv. vys. ucheb. zav.; gor.
zhur. 8 no.7:135-139 '65.   (MIRA 18:9)

1. Karagandinskiy politekhnicheskiy institut. Rekomendovana
kafedroy gornykh mashin.

YAREMA, V.D.

In the "Karagandashakhtostroi" combine. Shakht.stroi. no.11:9-10
N '57.   (MIRA 10:12)

1. Glavnyy inzhener kombinata Kragandashakhtstroy.
   (Karaganda Basin--Mining engineering)

KICHIGIN, A.F., dotsent; KUDRYASHOV, V.P., dotsent; SALTANOV, A.D.,
     inzh.; YAREMA, V.D., inzh.

     Experimental research on breaking coal from a massif. Izv.vys.
     ucheb.zav.; gor.zhur. no.4:97-105 '60.   (MIRA 14:4)

     1. Karagandinskiy politekhnicheskiy institut. Rekomendovana
     kafedroy gornykh mashin i rudnichnogo transporta.

               (Coal mines and mining)

YAREMA, V.D., kand.tekhn.nauk; BANK, A.S., inzh.

Overall mechanization of shaft sinking in Karaganda. Shakht.stroi.
8 no.12:1-5 D '64.   (MIRA 18:1)

1. Kombinat Karagandashakhtostroy (for Yarema). 2. TSentral'nyy
nauchno-issledovatel'skiy i proyektno-konstruktorskiy institut
podzemnogo i shakhtnogo stroitel'stva (for Bank).

KICHIGIN, A.F., dotsent; SALTANOV, A.D., inzh.; YAREMA, V.D., inzh.

Splitting of coal and rock by tearing away. Izv.vys. ucheb.zav.; gor.zhur. no.7:75-81 '60. (MIRA 13:7)

1. Karagandinskiy politekhnicheskiy institut. Rekomendovana kafedroy gornykh mashin.
                    (Mining engineering)

RYKOVSKIY, A.V., inzh.; YAREMA, V.D., inzh.

Using precast reinforced concrete timbering in horizontal and
slope workings in Karagnade Basin. Shakht. stroi. 5 no. 3:19-
22 Mr '61. (MIRA 14:2)

1. Kombinat Karagandashakhtostroy.
(Mine timbering) (Precast reinforced concrete)

KICHIGIN, A.F., dotsent; LOBODA, P.A., inzh.; SALTANOV, A.D., inzh.; YAREMA,
        V.D., dotsent

Experimental design of the cutter of a stoping cutter-loader. Izv.
vys. ucheb. zav.; gor. zhur. no.11:91-94 '61.   (MIRA 15:1)

1. Karagandinskiy politekhnicheskiy institut. Rekomendovana kafedroy
gornykh mashin i rudnichnogo transporta.
                              (Mining machinery)

YAREMA, V.D., inzh.; MARTYNCHUK, S.A., inzh.; ZUBOV, B.A., inzh.; SMIRNOV, L.N., inzh.

Completing 131.2 meters of shaft in one month. Shakht. stroi. 8 no.8:
18-20 Ag '64.   (MIRA 17:9)

1. Kombinat Karagandashakhtostroy (for Yarema). 2. Stroitel'noye
upravleniye Karagandashakhtoprokhodka (for Smirnov).

KICHIGIN, A.F.; POLOVNEV, O.P.; SALTANOV, A.D.; YAREMA, V.D.

Fracture of rock by breaking away. Nauch. trudy KNIUI no.13:
243-247 '64   (MIRA 18:1)

KICHIGIN, A.F., inzh.; SALTANOV, A.D., inzh.; YAREMA, V.D., inzh.

Testing a mining cutter-leader equipped with a new working part.
Shakht.stroi. 6 no.4:19-22 Ap '62.   (MIRA 15:4)

1. Karagandinskiy politekhnicheskiy institut (for Kichigin,
Saltanov). 2. Kombinat Karagandashakhtostroy (for Yarema).
                    (Mining machinery—Testing)

YAREMBASH, Yo. I.

"Thermal and X-Ray Phase Analysis of the System of Lithium Fluoride-Beryllium Fluoride." Sub 19 Jan 51, Moscow Order of Lenin State U imeni M. V. Lomonosov.

Dissertations presented for science and engineering degrees in Moscow during 1951.

SO: Sum. No. 480, 9 May '55

LAPITSKIY, A. V.; YAREMBASH, Ye. I.; SIMANOV, YU. P.

Columbium Pentoxide

Some properties of columbium pentoxide. Zhur. fiz, khim. 26, No. 1, 1952

261T36

YAREMBACH, Ye. I.

USSR/Chemistry - Fluoride Systems   Sep 52

"Thermal and Roentgen Phase Analysis of the System, LiF--BeF2," A.V. Novoselova, Yu.P.Simanov, and Ye.I. Yarembach, Moscow State U

Zhur Fiz Khim, Vol 26, No 9, pp 1244-1258

Authors were interested in system LiF----BeF2 because of desire to obtain previously unknown fluoride compds and because melts of BeF2 and LiF form components of special glasses with low indices of refraction. Stated that LiF underwent an enantiotropic polymorphous conversion at 827± 5°C. The mp of LiF was

261T36

261T36

equal to 845± 5°C. Clarified the reasons for the existence of the following binary fluorides: 2 LiF. BeF2 (Li2BeF4), which melts and decomposes at 461± 5°C; LiF.BeF2 (LiBeF3), which melts and decomposes at 353± 5°C; LiF.2BeF2 (LiBe2F5) which decomposes at 277± 5°C, without melting. Also revealed the probable tion of another binary fluoride with the probable compn of 5LiF.BeF2 (or 4LiF.BeF2). Cryst BeF2 melts similarly to glass, first softening at 577± 10°C. BeF2 congeals from the melt in the form of glass. In melts with LiF, BeF2 undergoes two polymorphous conversions. Roentgenograms of annealed melts of LiF and BeF2, contg over 65% of the latter, indicate the presence of quartz-like BeF2 in the melts

261T36

YAREMBASH, Ie. I.

USSR/Chemistry   FD-775

Card 1/1   : Pub 129-12/24

Author   : Lapitskiy, A. V.; Simanov, Yu. P.; Semenenko, K. N.; Yarembash, Ye. I.

Title   : Some properties of tantalum pentoxide

Periodical   : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, Vol 9, No 2, 85-89,
                   Mar 1954

Abstract   : Studied the dehydration process of tantalum pentoxide hydrate in the
                   temperature range of 25-450 degrees. Established the possibility of
                   the existence of a tantalic acid with the composition $H_7[Ta(TaO_4)_4]$.
                   Also studied the possible polymorphic conversions of tantalum pentoxide
                   using X-ray and thermographic techniques. Determined the parameters of
                   two modifications of tantalum pentoxide indicated in the rhombic lattice.
                   Expressed an assumption regarding the possibility of the existence of
                   a tantalic acid having the composition $H_{13}[Ta(TaO_4)_6]$. One table.
                   Eight references (three foreign).

Institution   : Chair of Inorganic Chemistry

Submitted   : July 11, 1953

YARE H, Y

NOVOSELOVA,A.V.; PASHINKIN,A.S.; SEMENENKO,K.N.; YAREMBASH,Ye.I.

Instrument designed for laboratory work with hygroscopic and
hydrolyzing substances.   Zav.lab.21 no.7:857-858 '55.
(MIRA 8:10)

1. Moskovskiy gosudarstvennyy universitet
(Chemical apparatus)

S/078/62/007/002/005/019
B119/B110

AUTHORS: Yarembash, Ye. I., Vigileva, Ye. S., Luzhnaya, N. P.

TITLE: Study of the Bi_2Se_3 - As_2Se_3 section of the ternary

             Bi - As - Se system

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 2, 1962, 346 - 350

TEXT: The compounds Bi_2Se_3 and As_2Se_3 obtained from the elements by
melting in evacuated quartz ampullas were fused in different mixing pro-
portions (concentration interval 10%). The alloys formed were studied as
follows: x-ray phase analysis, thermal analysis (with ФПК-59 (FPK-59)
Kurnakov pyrometer), determination of microhardness (with ПМТ-3 (PMT-3)),
microstructural analysis (МИМ-7 (MIM-7) microscope), determination of
electrical conductivity in the temperature range from +18 to +170°C
(ППТН -1 (PPTN-1) and МОМ -3 (MOM-3) conductivity measuring instruments)
and of the thermoelectromotive force (thermo-emf) as to Cu (temperature
difference ~10°C), measuring of the Hall effect (magnetic fieldstrength:
10,000 oersted) and of the photoelectric effect (ascertaining of the photo-
conductive effect by exposing the samples to a 500 w lamp at 1 m distance:
Card 1/3

S/0'.9/62/007/002/005/019
B119/B110

Study of the Bi_2Se_3...

investigation of the dependence of the photocurrent on the length of the light waves). The alloys were studied also in tempered state (1000 hr at 200°C). Results: The phase diagram of the Bi_2Se_3 - As_2Se_3 section of the ternary Bi - As - Se system is shown in Fig. 2. In solid state, the different components show only limited solubility in the eutectic. Bi_2Se_3 and As_2Se_3 never interact chemically. A noticeable photoconductive effect could not be found in any of the alloys. Their electrical conductivity is within the range of the conductivity of the initial components (resistivity at 293°K in ohm·cm: Bi_2Se_3 crystalline $5.8 \cdot 10^{-4}$; As_2Se_3 amorphous $\sim 10^{10}$). Alloyed with Bi_2Se_3, glassy As_2Se_3 is existent merely up to 323 ± 5°C; at elevated temperatures it blends into the crystalline state. Z. A. Starikova and L. I. Antonova are thanked for making the x-ray phase analysis. There are 7 figures, 1 table, and 9 references: 3 Soviet and 6 non-Soviet. The four references to English-language publications read as follows: G. A. Geach, R. A. Jeffrey, J. Metals, 5, 1084 (1953); J. Black, E. M. Conwill, L. Leigle, C. W. Spencer. J. Phys.

Card 2/3

Study of the Bi_2Se_3...

Chem. Col., 2, 240 (1957); E. Mooser, W. B. Pearson. Phys. and Chem. Solids, 7, 65 (1958); E. Mooser, W. B. Pearson. J. Electron, 1, 629 (1956).

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova Akademii nauk SSSR (Institute of General and Inorganic Chemistry imeni N. S. Kurnakov of the Academy of Sciences USSR)

SUBMITTED: July 14, 1961

Fig. 2. Phase diagram of the Bi_2Se_3 - As_2Se_3 system. Abscissa: As_2Se_3, mole%.

Fig. 2
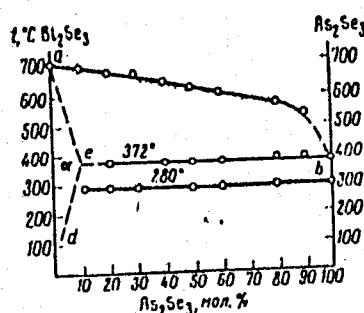
Card 3/3

S/078/62/007/012/013/022
B144/B180

AUTHORS: Yarembash, Ye. I., Vigileva, Ye. S.

TITLE: Interaction of bismuth and arsenic selenides

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 12, 1962, 2752-2755

TEXT: Previous studies (Zh. neorgan. khimii, 7, 346 (1962)) were continued to establish the phase equilibria and physical properties of $Bi_2Se_3 - As_2Se_3$ alloys obtained from crystalline Bi_2Se_3 and amorphous As_2Se_3. Three phase diagrams were plotted, two of which are for intermediate nonequilibrium phases. All three exhibited a eutectic with almost pure As_2Se_3, melting around $372^\circ C$, and the same liquidus curves. In the diagram obtained from liquid $Bi_2Se_3 -As_2Se_3$ alloys, the effect at $184^\circ C$ indicates restructuration of amorphous As_2Se_3 (softening range 170 - $380^\circ C$) and that at $323^\circ C$ its exothermic crystallization. Both effects increase with As_2Se_3 content. Microstructural analysis of molten alloys with more than 1% As_2Se_3

Card 1/3

Interaction of bismuth and arsenic ...
S/078/62/007/012/013/022
B144/B180

revealed a crystalline Bi_2Se_3 and an amorphous As_2Se_3 phase. The x-ray patterns showed one crystalline phase corresponding to the Bi_2Se_3 lattice. The second diagram was obtained from alloys annealed for 1000 hrs at 200^0C. That the 280^0C effect might be due to polymorphous As_2Se_3, or an intermediate selenide, As_2Se_2, was disproved by x-ray analysis which revealed crystalline phases of monoclinic As_2Se_3 (m. p. $\sim 380^0C$) and of Bi_2Se_3 (m. p. $\sim 710^0C$). The third diagram based on alloys annealed for 2100 hrs at 230^0C is the nearest approximation to the equilibrium state. In the solid state the solubility of the components did not exceed 1%. In amorphous and crystalline As_2Se_3 the photoconductive effect had a maximum at $0.66 - 0.61\mu$; in an annealed sample containing 2 mole-% Bi_2Se_3 it was slightly toward the right. The forbidden-band width was 1.6 ev (18^0C) for amorphous and 1.8 ev for polycrystalline As_2Se_3. There are 3 figures and 1 table.
Card 2/3

Interaction of bismuth and arsenic ...   S/078/62/007/012/013/022
                                          B144/B180

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S.
              Kurnakova Akademii nauk SSSR (Institute of General and
              Inorganic Chemistry imeni N. S. Kurnakov of the Academy of
              Sciences USSR)

SUBMITTED: March 12, 1962

Card 3/3

Semiconducting compounds of lanthanides with selenium and tellurium.
Ye. I. Yarembash, A. A. Yeliseyeva, Ye. S. Vigileva, V. I. Kalitin.

Report presented at the 3rd National Conference on Semiconductor Compounds,
Kishinev, 16-21 Sept 1963

L 11266-63   EWQ(q)/EWT(m)/BDS---AFFTC/ASD---JD
ACCESSION NR: AP3001230   S/0078/63/008/006/1542/1543   56

AUTHOR:. Yarembash, Ye. I.; Vigileva, Ye. S.; Yeliseyev, A. A.; Antonova, L. I.

TITLE: Lanthanum tellurides ??.

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 6, 1963, 1542-1543

TOPIC TAGS: lanthanum telluride, lanthanum reaction product, lanthanum—tellurium
phase system, specific resistivity, thermal emf

ABSTRACT: Conditions for the formation of lanthanum tellurides have been studied,
together with the phase composition of the products formed from the reaction of
La and Te. The tellurides were synthesized by heating a mixture of finely powdered
La and Te in the presence of a very small amount of iodine and also by the reaction
of LaH_3 with Te vapor. Several phases, among them LaTe, La_2Te_3, and $LaTe_2$, were
identified. X-ray analysis indicated the possible formation of two additional
phases whose properties and compositions are not known. Compound LaTe crystallizes
as an NaCl-type lattice with $a = 6.407 \pm 0.005$ kX, a value commensurate with data

Card 1/2

L 11266-63
ACCESSION NR: AP3001230   C

in the literature. The specific resistivity and thermal emf of compacted samples
at room temperature were found to be $p = 1.5 \cdot 10^5$ ohm·cm and $\alpha = -40$ to -50 $\mu v/deg$
for LaTe, $p = 4 \cdot 10^2$ ohm·cm and $\alpha = -20$ to -30 $\mu v/deg$ for La_2Te_3, and for
$p = 2.4 \cdot 10^{-1}$ ohm·cm and $\alpha = +15$ to $+20$ $\mu v/deg$ for $LaTe_2$. The presence of a
negative temperature coefficient of resistivity was established in all cases
studied, and all compounds—with the exception of $LaTe_2$—were of n-type conducti-
vity. Orig. art. has: 1 table.

ASSOCIATION: none

SUBMITTED: 21Jan63   DATE ACQ: 01Jul63   ENCL: 00

SUB CODE: CH   NO REF SOV: 000   OTHER: 005

nh/ttb
Card 2/2

L 17413-63   EWP(q)/EWT(m)/BDS   AFFTC/ASD   RDW/JD

ACCESSION NR: AP3004361   S/0078/63/008/008/2011/2012

AUTHORS: Zorina, Ye. L.; Yarembash, Ye. I.; Vigileva, Ye. S.

TITLE: Infrared absorption of arsenic triselenide   57

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 8, 1963,
2011-2012

TOPIC TAGS: As_2Se_3, As_2O_3, IR-spectrum

ABSTRACT: The IR absorption of arsenic triselenide has been
intensely studied during the past few years. Result of these
studies was the determination of the end of the absorption line
for arsenic triselenide. This end was found to be near 0.8μ.
The absorption lines are tabulated. The absorption spectra for
As_2Se_3 and As_2O_3 was found to be slightly different from those
reported heretofore. As_2Se_3 was synthesized from pure elements.
Their purity was controlled by spectral analysis and results are
tabulated. It was shown by the use of 1.35 mm cells that the
most intense line is at 20.9μ and corresponds to As_2Se_3. Hence,

Card   1/2

L. 17419-63

ACCESSION NR: AP3004361   O

the line at 15.7 u cannot be considered as the basic selenium
line as is believed by other authors. Orig. art. has: 2 figures
and 1 table.

ASSOCIATION: none

SUBMITTED: 04Mar63   DATE ACQ: 21Aug63   ENCL: 00

SUB CODE: CH   NO REF SOV: 002   OTHER: 005

Card   2/2

YELISEYEV, A.A.; YAREMBASH, Ye.I.; VIGILEVA, Ye.S.

Lanthanum ditelluride $LaTe_2$. Dokl. AN SSSR 153 no.6:1333
D '63.
(MIRA 17:1)

1. Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova
AN SSSR. Predstavleno akademikom I.V. Tananayevym.

thermal electromotive force

ACCESSION NR: AP4036962   8/0078/64/009/005/1032/1037

AUTHOR: Yeliseyev, A. A.; Yarembash, Ye. I.; Vigileva, Ye. S.; Antonova, L. I.;
Zachatskaya, A. V.

TITLE: The polymorphism of lanthanum

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 5, 1964, 1032-1037

TOPIC TAGS: lanthanum, polymorphism structure, x ray analysis, microstructure,
differential thermal analysis, alpha lanthanum, beta lanthanum, lattice contrac-
tion, thermogram, enantiotropic transformation, melting temperature, gamma lantha-
num, coefficient of expansion

ABSTRACT: The structure of lanthanum was investigated in samples (containing 0.7
and 0.2% impurities) by x-ray, microstructural and differential-thermal analyses.
Under ordinary conditions lanthanum consists of the alpha- and beta-modifications
with the alpha-form predominating. Lattice parameters of these modifications are:
  α - La .. a = 3.755 $\pm$ 0.005Å   c = 12.024Å
  β - La   a = 5.291 $\pm$ 0.005Å
Differential thermal analysis curves of La (and of La with quartz to determine the

Card   1/4

ACCESSION NR: AP4036962

effects of impurities) were constructed (fig. 1.). The transition from alpha to beta lanthanum occurs at about 260C (with the top limit at 400C; above that only traces of alpha are retained); the transition from beta to gamma is at 850C, and melting is at 900C. The endo- and exothermic effects at 400, 560 and 745C were not explained. The anomalous contraction at 325C is associated with a sharp decrease in the beta-lattice spacing. An insignificant decrease in the parameter of the alph-lanthanum lattice along the c axis was observed at 200-330C. The coefficient of linear expansion of beta-lanthanum at 300-330C is approximately -400×10^{-6} degrees^{-1}. At temperatures above 550C lines appear on the La x-ray which do not correspond to either of the known modifications or their oxides. The number of these lines increases with increase in temperature. This is in accord with the presence of the "sliding" effect at 550-710C on the La thermogram. After cooling, the molten metal recovers its original structure. At 850C beta-lanthanum is enantiotropically transformed to gamma-lanthanum. Orig. art. has: 4 figures and 4 tables.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova, Akademii nauk SSSR (Institute of General and Inorganic Chemistry/Academy of

Card   2/4

ACCESSION NR: AP4036962

Sciences, SSSR)

SUBMITTED: 07Jun63   DATE ACQ: 05Jun64   ENCL: 01

SUB CODE: IC,OP.   NO REF SOV: 002   OTHER: 017

Card 3/4

ACCESSION NR: AP4036962

Fig. 1. DTA (heating) curves:
a--lanthamm; b--mixture of
lanthanum with (3.5 wt.%)
quartz; c--quartz.

time, minutes
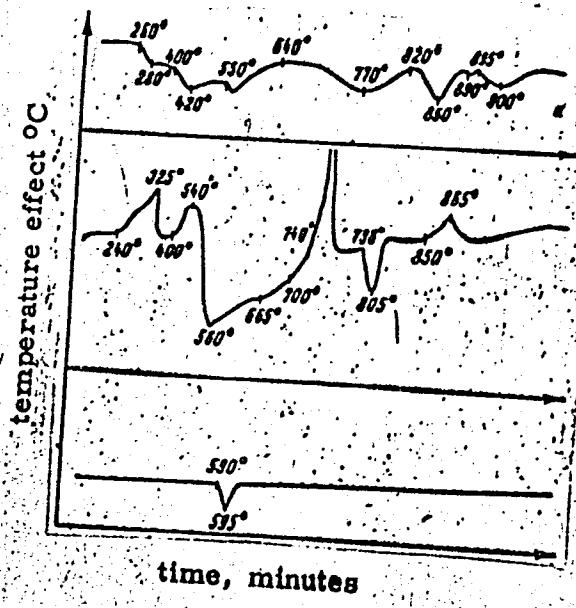
Card4/4

ACCESSION NR: AP4036975   S/0078/64/009/005/1302/1303

AUTHOR: Kalitin, V. I.; Luzhnaya, N. P.; Yarembash, Ye. I.;
Zinchenko, K. A.

TITLE: Single crystals of praseodymium and neodymium selenides

SOURCE: Zhurnal neorganicheskoy khimii, v. 9, no. 5, 1964,
1302-1303

TOPIC TAGS: single crystal, rare-earth selenide, praseodymium
selenide, neodymium selenide, crystal growth, chemical transport
reaction

ABSTRACT: $PrSe_2$, $NdSe_2$, and Nd_2Se_3 single crystals have been
synthesized by the previously described diffusion method, using a
chemical transport reaction with iodine. Optimum conditions for the
reactions were established empirically. Habitus of the crystals
and x-ray crystallographic data are indicated. The Nd_2Se_3 rhombic
crystals were obtained for the first time. Orig. art. has: 1 figure.

Card 1/2

ACCESSION NR: AP4036975

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova, Akademii nauk SSSR (Institute of General and Inorganic Chemistry, Academy of Sciences, SSSR)

SUBMITTED: 04Nov63   DATE ACQ: 05Jun64   ENCL: 00

SUB CODE: .88   NO REF SOV: 000   OTHER: 003

Card 2/2

(A) L 27859-66   EWT(1)/EWT(m)/T/EWP(t)/EWP(b)/EWA(c)   IJP(c)   JD/JG/GG

SOURCE CODE: UR/0030/65/000/010/0049/0054

ACC NR: AP5028625

AUTHOR: Luzhnaya, N. P. (Doctor of chemical sciences); Yarembash, Ye. I. (Candidate of chemical sciences); Medvedeva, Z. S. (Candidate of chemical sciences)

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Method of transport reactions in semiconductor chemistry

SOURCE: AN SSSR. Vestnik, no. 10, 1965, 49-54

TOPIC TAGS: single crystal growing, semiconductor single crystal, semiconducting film, boron compound, phosphide, selenide, telluride, rare earth element, semiconducting material, refractory, single crystal, chemical reaction

ABSTRACT: Since 1962, the semiconductor chemistry laboratory of the Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences SSSR (laboratoriya khimii poluprovodnikov Instituta obshchey i neorganicheskoy khimii Akademii nauk SSSR) has been conducting systematic research on growing single cry-stals of boron phosphide and rare earth selenides and tellurides by the method of transport reactions. The mechanism of these reactions is explained, and a description of the preparation of boron phosphide (BP) in the form of single crystals and polycrystalline layers is given. Also discussed is the preparation of chalcogenides of elements of the cerium group having the composition Me_2X_3 and MeX_2 and char-acterized by semiconducting properties. It is concluded that the method of transport reactions for growing single crystals and films of refractory semiconductors has great

UDC: 621.315.52

Card 1/2

L 27859-66

ACC NR: AP5028625

O

promise and will soon find industrial applications. Orig. art. has: 7 figures and
3 formulas.

SUB CODE: 20, 07 / SUBM DATE: none

Card 2/2

produce compounds of the rare earth elements with non-metallic elements.
the chalcogenides, which might be used as high-temperature semi-

ducted in quartz ampules (£ 10⁻³ mm residual pressure ——— —— — — —

The presence of free lanthanum and tellurium were determined by differential

differential was used for determining phase com-

The reaction mechanism is typical for solid state

Card 2/2

ZORINA, Ye.L.; YAREMBASH, Ye.I.

Infrared absorption of PrTe$_2$. Izv. AN SSSR. Neorg. mat. 1
no.3:446 Mr '65.   (MIRA 18:6)

1. Institut obshchey i neorganicheskoy khimii imeni Kurnakova
AN SSSR.

ABSTRACT: Crystallochemical properties of lanthanum tellurides have been studied by x-ray phase analysis and differential thermal analysis of the polycrystalline samples which were synthesized by a technique previously described by the authors [Zh. neorgan khimii, 9, 876, (1964)]. The complete phase diagram of the La-Te System was established for the first time on the basis of the new data. Homogeneity limits of the six identified phases were determined. One of the six phases, La_2Te_5, was detected for the first time. The phase previously identified as La_4Te_7 was found to be $LaTe_{1.7+X}$. Crystallographic characteristics of all phases were given. The existence of the $MTe_{1.7+X}$ and M_2Te_5 phases, where M is a rare earth element from Ce to Sm, was presumed on the grounds of crystallochemical analogy.

UDC: 546.654'241:548.19

Card 1/2

ACC NR: AP5022248

between the rare-earth tellurides of other types. Orig. art. has: 8 tables and 5 figures.

SUB CODE: 07 / SUBM DATE: none / ORIG REF: 006 / OTH REF: 011

Card 2/2

CHECHERNIKOV, V.I.; PECHENNIKOV, A.V.; YAREMBASH, Ye.I.; KALITIN, V.I.

Magnetic properties of praseodymium selenides. Izv. AN SSSR.
Neorg. mat. 1 no.12:2138-2139 D '65.   (MIRA 18:12)

1. Moskovskiy gosudarstvennyy universitet i Institut obshchey
i neorganicheskoy khimii im. N.S. Kurnakova AN SSSR. Submitted
July 12, 1965.

KALITIN, V.I.; YAREMBASH, Ye.I.

Growth of crystals in the system $Pr_2Se_3 - I_2$. Izv. AN SSSR.
Neorg. mat. 1 no.12:2170-2177 D '65.   (MIRA 18:12)

1. Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova
AN SSSR. Submitted July 12, 1965.

LUZHNAYA, N.P., doktor khim. nauk; YAREMBASH, Ye.I., kand. khim. nauk;
    MEDVEDEVA, Z.S., kand. khim. nauk

    Method of transport reactions in the chemistry of semiconductors.
    Vest. AN SSSR 35 no.10:49-54 O '65.   (MIRA 18:10)

    1. Institut obshchey i neorganicheskoy khimii im. N.S. Kurnakova
    AN SSSR.

L 06581-67   EWT(m)/EWP(t)/ETI   IJP(c)   JD/JG

ACC NR: AP6029811   SOURCE CODE: UR/0363/66/002/008/1367/1370

AUTHOR: Yeliseyev, A. A.; Yarembash, Ye. I.   41

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of
Sciences SSSR (Institut obschey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Study of single crystals of the rare earth polyselenide elements in the cerium
subgroup of the general formula MSe_{2-x}

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 8, 1966, 1367-1370

TOPIC TAGS: single crystal, rare earth element, selenide, selenium compound, cerium,
x ray spectroscopy

ABSTRACT: The structure of single crystals of MSe_{2-x} polyselenides, where M- is La,
Ce, Pr, Nd, and Sm, was investigated by x-ray technique. The dimensions of the single
crystals varied from few hundredths of a millimeter to 1.5 mm. The x-ray diagrams were
taken using RKOP and KFOR-44 cameras with Cu- and Mo-irradiation sources. All single
crystals studied were found to belong to the tetragonal syngony, D_{4h} class, and two
groups: with $c/a \approx 2$ (for compounds of general formula MSe_{2-x} at $x < 0.2$) and $c/a \approx$
1 (for compounds with general formula M_4Se_7 or M_7Se_{12}-Me_{2-x} at $x > 0.3$). The Me_{2-x}

UDC: 546.65'231:548.55

Card 1/2

L 06581-67

ACC NR: AP6029811

with P4/nmm symmetry and two formula units in an elementary cell was found to be iso-structural with MTe_2-type compounds of the rare earth metals of the cerium subgroup.
Orig. art. has: 1 figure, 2 tables.

SUB CODE: 20/   SUBM DATE: 01Nov65/   ORIG REF: 007/   OTH REF: 006

Card 2/2

L 06483-67   EWT(m)/EWP(t)/ETI   IJP(c)   JD/JG

ACC NR: AP6028295   SOURCE CODE: UR/0363/66/002/006/0984/0990

AUTHOR: Yarembash, Ye. I.; Yeliseyev, A. A.; Kalitin, V. I.; Antonova, L. I.

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences, SSSR (Institut obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: X-ray diffraction analysis of praseodymium selenides

TOPIC TAGS: praseodymium compound, selenide, X ray diffraction study

ABSTRACT: The object of the work was to study the phase composition, crystal structure, and regions of homogeneity of the products obtained from a direct reaction between praseodymium and selenium. X-ray diffraction analysis of the praseodymium selenides obtained showed the existence of the following individual phases: $PrSe$, Pr_5Se_6, $Pr_{3-x}Se_4$, $Pr_4Se_{7\pm x}$, $PrSe_{1.9-x}$ and Pr_3Se_{7+x}. The phases Pr_5Se_6, $Pr_4Se_{7\pm x}$ and $Pr_3Se_{7\pm x}$ in the Pr-Se system were identified for the first time. $PrSe$ (50 at. % Se) has a face-centered cubic NaCl-type lattice, $a = 5.941$ Å. Pr_5Se_6 (54.5 at. % Se) crystallizes in a low-symmetrical, probably monoclinic system. $Pr_{3-x}Se_4$ (where $0 = x = 0.33$) has a body-centered cubic lattice with a Th_3P_4-type structure; its region of homogeneity extends from 57.2 to 60.0 at. % Se; $a = 8.881$ Å for Pr_3Se_4 and $a = 8.895$ Å for Pr_2Se_3. X-ray structural analyses of Pr_4Se_7 and $PrSe_{1.9}$ single crystals were carried out for the first time, and their unit cell parameters and space groups were deter-

Card 1/2   UDC: 546.656'231:539.261

L 06163-67

ACC NR: AP6028295

mined. The (Cu_2Sb)-type structure is possible for $PrSe_{1.9}$. $Pr_4Se_{7\pm x}$ ($0 = x = 0.2$)
has a tetragonal lattice and a = 8.44 ± 0.05 Å, c = 8.49 ± 0.05 Å, c/a = 1.006; Z = 2;
space group P4 / mbm; the structure is apparently close to that of $PrSe_{1.9-x}$. The
region of homogeneity extends from 63.0 to 64.2 at. % Se. $PrSe_{1.9-x}$ crystallizes in
the tetragonal system with a = 4.17 ± 0.005 Å, c = 8.40 ± 0.005 Å; c/a = 2.014; Z = 2;
space group P4 / mmm; region of homogeneity from 65.5 to 64.3 at. % Se. $Pr_3Se_{7\pm x}$
($0 = x = 0.5$) has a tetragonal lattice with an unknown structure; region of homogeneo-
ity from 69.2 to 71.5 at. % Se. Praseodymium triselenide $PrSe_3$ was not observed.
Authors thank Dr. of Chemical Sciences Prof. N. P. Luzhnaya and Dr. of Chemical Sci-
ences V. G. Kuznetsov for their steady interest and assistance. Orig. art. has: 1
figure and 2 tables.

SUB CODE: 07/ SUBM DATE: 22Nov65/ ORIG REF: 013/ OTH REF: 009

Card 2/2 mkc

L.06480-67   EWT(m)/EWP(e)/EWP(t)/ETI   IJP(c)   WH/JD/JG

ACC NR: AP6028292   SOURCE CODE: UR/0363/66/002/006/0973/0975

AUTHOR: Slovyanskikh, V. K.; Ellert, G. V.; Yarembash, Ye. I.; Korsakova, M. D, 34/13

ORG: Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences, SSSR (Institute obshchey i neorganicheskoy khimii Akademii nauk SSSR)

TITLE: Preparation of uranium chalcogenide single crystals by means of chemical transport reactions

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 6, 1966, 973-975

TOPIC TAGS: uranium compound, single crystal growing, sulfide, selenide, telluride

ABSTRACT: The article describes the preparation of USe_2, USe_3, UTe_2 and US_2 single crystals from uranium metal and the chalcogenide in evacuated quartz ampoules with bromine as the transport agent, and presents some data on the conditions of their growth and morphology. The yield of the single crystals was studied as a function of the temperature, bromine concentration, total amount of uranium present in the ampoule and the Te/U ratio. As the latter increases from 0.9 to 1.9, UTe_2 single crystals grow; above 1.9, UTe_3 crystals begin to grow. As the Te/U ratio increases the amount of the crystallizing tritelluride increases. At $Te/U \leq 1.1$, fine silicon single crystals are formed together with UTe_2, and at $Te/U = 0.7$, practically only Si single crystals are formed. The dependence of the yield of UTe_2 crystals on the initial bromine concentration was determined: in the range of low Br concentration, as

Card 1/2   UDC: 546.791'851:548.55

L 06480-67

ACC NR: AP6028292 O

the latter rises, the transport of U increases sharply and reaches a certain maximum value, then decreases and remains unchanged. UTe_2 single crystals were obtained in the form of blocks consisting of several single crystals, or in the form of individual single crystals. USe_3 and UTe_3 crystallized in the form of thin bands 1-2 mm wide and up to 20 mm long. USe_2 and US_2 single crystals were formed under conditions similar to those of UTe_2. Orig. art. has: 5 figures.

SUB CODE:20,07/ SUBM DATE: 23Nov65/ OTH REF: 018

Card 2/2 mse